view of an improvement of the degree of freedom of the mount design. For this reason, it is necessary to design the polygon mirror **14** and aperture mirror **15** in optimum sizes. In particular, the effective light receiving area of the polygon mirror **14** varies according to a scanning angle in scanning. Moreover, since the light receiving signal level in scanning the farthest point within the scanning region determines the lowest level, it is desirable to design the aperture mirror **15** and polygon mirror **14** so that a cross-sectional area of the polygon mirror **14** seen from the aperture mirror **15** and a cross-sectional area of the aperture mirror **15** seen from an optical axis direction in scanning the farthest point are identical with each other, and it is possible to construct an optimum scanning light receiving system in such a design.

[0049] **FIG. 5** is a front view of the aperture mirror **15** of the present invention designed by considering the above-mentioned aspects. The shape of the aperture mirror **15** is asymmetrical in a scanning direction (the right-and-left direction) about the optical axis. By forming the aperture mirror **15** in such an asymmetrical shape, the effective light receiving area can be increased, and consequently the SIN ratio is improved. In particular, when the mounting space is taken into consideration, the asymmetry in the scanning direction can effectively improve the light receiving efficiency by securing a large light receiving area on the scanning start side.

[0050] By the way, since the display screen **10** is located below the path of the scanning light, even when the lower side of the light receiving surface of the aperture mirror **15** is enlarged, it does not contribute to an improvement of the light receiving efficiency. It is therefore preferable to secure a large light receiving area on the side higher than the scanning surface of the polygon mirror **14** by designing the shape of the aperture mirror **15** asymmetrical in the vertical direction about the optical axis. **FIG. 6** is a front view of the aperture mirror **15** designed accordingly, and **FIG. 7** is a schematic diagram of a scanning light receiving system of the present invention using such an aperture mirror **15**.

[0051] This structure secures the aperture mirror **15** with a light receiving surface height as high as the height of the light receiving surface of the polygon mirror **14**, and it is meaningless to make the aperture mirror **15** larger than this level because even if the aperture mirror **15** is made larger than this level, only a region which does not contribute to the reception of light increases. By designing the aperture mirror **15** to have such a structure, it is possible to improve the light receiving efficiency in comparison with a structure having a light receiving surface symmetrical in the vertical direction, without changing the scanning surface height.

[0052] **FIG. 8** is a graph showing the relationship between the scanning angle and the light receiving scanning surface opening width. Since the beam width is finite, the light receiving surface on the scanning region side must not extend into a detection region. The S/N ratio is most lowered when scanning the diagonal section (when the scanning angle is 66 degrees) at which the quantity of the reflected light is minimum, and, therefore, in the present invention, in order to secure a light receiving scanning surface opening width (w+W) for this scanning, the width of the aperture mirror **15** is specified to this light receiving scanning surface opening width (w+W). Moreover, in the present invention, the polygon mirror **14** is set at a mountable maximum height, and the height of the aperture mirror **15** is determined in accordance with the height of the polygon mirror **14**.

[0053] **FIG. 9** and **FIG. 10** are the front view and sectional side view of the aperture mirror **15** of the present invention. For the reason as mentioned above, the aperture mirror **15** of the present invention has an asymmetrical shape in the scanning (right-and-left) direction and the vertical direction as shown in **FIG. 9**.

[0054] The aperture mirror **15** is made of a metal such as aluminum, but, when its surface rusts, its reflectance characteristic deteriorates. In the present invention, therefore, a surface of the aperture mirror **15** that faces the polygon mirror **14** has a mirror finish, and the mirror-finished surface is covered with a protective film **15*b*** made of a dielectric such as SiO and SiO_2 for protecting the mirror-finished surface from moisture and dust which cause rust. Besides, in this example, the angle of incidence of the reflected light from the recurrence reflection sheet **7** on the aperture mirror **15** (protective film **15*b***) is 45 degrees.

[0055] **FIG. 11** is a graph showing the relationship between the film thickness of the protective film **15*b*** made of SiO_2 and the reflectance when light having a wavelength of 780 nm enters the aperture mirror **15** at an angle of 45 degrees. It will be understood from **FIG. 11** that the reflectance is maximum when the film thickness of the protective film **15*b*** is 2300 Å. In the present invention, therefore, the film thickness of the protective film **15*b*** made of SiO_2 is made 2300 Å so as to obtain the maximum reflectance for the laser light having a wavelength of 780 nm used for scanning, thereby improving the S/N ratio.

[0056] Moreover, it is possible to provide on the surface of the aperture mirror **15** an antireflection film having a multilayer film structure for preventing reflection of light other than the scanning light of a specific wavelength (780 nm). **FIG. 12** is a graph showing the wavelength-reflectance characteristics of this antireflection film when the angle of incidence is 45 degrees, and this antireflection film has a characteristic of selectively reflecting light in the vicinity of 780 nm. Thus, since a high reflectance characteristic can be exhibited only for the specific angle of incidence (45 degrees) and wavelength (780 nm) of incident light by providing such an antireflection film, it is possible to guide only desired recurrence reflected light to the light receiving system and prevent reflection of disturbing light, thereby improving the SIN ratio.

[0057] Furthermore, by combining a cold mirror coat for efficiently removing infrared ray components and a visible light cut-off filter and appropriately using the band difference therebetween, it is possible to perform a function of selectively reflecting the recurrence reflected light of the specific wavelength (780 nm). **FIG. 13** is a graph showing the reflectance characteristic of this cold mirror coat and the transmittance characteristic of this visible light cut-off filter, and it will be understood from **FIG. 13** that only light in the vicinity of 780 nm can be selectively reflected. Further, it is also possible to perform a similar function by combining a hot mirror coat and an infrared light cut-off filter.

[0058] Next, the following description will explain an arrangement of the optical units **1*a*** and **1*b*** in the optical scanning-type touch panel of the present invention. **FIG. 14** is a schematic diagram showing the positional design of the optical members of the optical units **1*a*** and **1*b*** and a state of scanning light.